being as cause and effect of the healthy operation of this basic system of the animal œconomy. And as it is not essential to the motions of the iris, either to their performance or that they be understood, that they partake of any of those peculiarities, the distinguishing features of muscular tissue, and as we find that this membrane is obedient to those laws which are applicable to each organ under immediate sympathetic influence, and opposed to those phenomena which result from spinal and cerebral influence, it may be asserted that the contractility of the iris is, *primo loco*, the motor power of the sympathetic. For the iris is an irritable membrane with power alone of involuntary motion and tension, its active condition agreeing in these respects with vegetative life in general. And as animal death may be said to ensue when deep sleep takes possession of the senses, when those systems under spinal and cerebral influence are rendered inactive, to be fitted for renewed exertion on waking, it follows, that those organs which still remain active cannot be governed on the same principle, but must necessarily be subject to the sole remaining power, through which is accorded involuntary motion, motion which never tires, and tension its active condition.

The fimbriated edge of the ciliary body floats loosely in the posterior chamber around the lens, to produce, through the to and fro motion of each process (their aggregate number representing a circle), a current forwards or towards the iris. The force of this current is in a ratio to the pupillary opening, being increased as this is contracted, to produce, in proportion to its contraction, convexity of the iris. On the escape of the aqueous humour from the chambers, these processes fall down to form a serrated border upon the lens.

7. "On the Automatic Temperature-compensation of the Force Magnetometers." By C. Brooke, M.B., F.R.S. Received May 8, 1851.

After explaining the necessity of automatic temperature-compensation in these instruments in order to give the highest degree of accuracy to results deduced from the ordinates of the magnetic curves, the author infers from a reference to the formula expressing the conditions of equilibrium of the bifilar magnet, that the interval between the lower extremity of the suspension lines will be most advantageously submitted to some mechanical agency governed by change of temperature.

The object in view has been attained by attaching the lower ends of the suspension skein to the adjacent ends of two zinc tubes that are clamped to a glass rod which is attached at its middle point to the middle of the bar-magnet. When the temperature rises, the ends of the skein will evidently be approximated to each other by a quantity that is equal to the difference of expansion of the lengths of zinc and glass intervening between the clamps. The interval between the clamps is to be approximately determined by calculation, and corrected by experiment, so that the ratio of the expansion to the distance between the threads may be equal to the first term of the temperature coefficient.

In the balanced magnetometer the compensation is effected by

means of a small thermometer attached to the magnet, the stem of which is parallel to the axis of the bar. In this thermometer, the size of the bulb, its distance from the freezing-point and length of the scale, may be so proportioned to each other, that the second as well as the first term of the temperature coefficient will be represented in the correction.

8. "On the Reproduction of the *Ascaris Mystax*." By Henry Nelson, M.D. Communicated by Allen Thomson, M.D., F.R.S. Received May 22, 1851.

The author commences with a brief anatomical description of the *Ascaris Mystax*, found in the intestinal canal of the Domestic Cat; with more especial reference to the organs of generation in the two sexes. He traces the gradual formation of the semen; originally thrown off as seminal particles by the cæcal extremity of the tubular testicle, the exterior of each solid particle enlarges to constitute a cell, while the interior retains its consistency and forms a nucleus. The cell then acquires a granular protecting envelope, and in this state is introduced into the female. The solution of the protective envelope and the great enlargement of the seminal cell follow, and its nucleus is now seen to present a granular structure. The external granules of the nucleus coalesce to form a membrane, at first exactly resembling a watch-glass in shape, but by the contraction of its margin ultimately forming a curved cæcal tube. This is the true spermatic particle or spermatozoon, and is set free by the rupture of the seminal cell.

The generative apparatus of the female, commencing also in cæcal extremities, is next treated of, and the author draws particular attention to a transparent, narrow contractile portion, the oviduct, intervening between the ovary and uterus, as the part in which the ovule encounters the spermatic particles, and is by them fecundated. The cæcal end of the ovary likewise throws off a solid particle, which enlarging forms a germinal vesicle and spot. As the germinal vesicle travels slowly down the tubular ovary, it acquires a thick granular investment or yolk, secreted by the ovarian walls. The ovules now present a flattened triangular shape, are placed side by side, and form one solid mass. At the commencement of the oviduct however they become detached, separated from each other, and propelled singly along its interior. Here the gelatinous ovule meets the tubular spermatic particles, and is surrounded on all sides by them. They are at first seen to be merely applied against the ovule, but by degrees the margin of the latter presents a rupture, some of the vitelline granules are displaced, and the spermatic particles become imbedded in the substance of the yolk itself.

While the penetration of the spermatic particles is going on, a chorion, secreted by the oviduct, surrounds the ovule, forming a spherical envelope, within which the germinal vesicle, the granular yolk, and the imbedded spermatozoa, are enclosed. The spermatic particles after penetration are seen to swell, become transparent, and ultimately to dissolve. The vitelline granules likewise either disap-